CLAIMS

1. Process for locating and measuring deformations in a civil engineering structure, characterised by the fact that at least one geosynthetic fabric (1) containing a plurality of optical fibres (2a to 2e) in parallel and capable of transmitting signals is applied in the said structure or under the said structure,
the said optical fibres containing Bragg gratings (3), evenly spaced in series (4) of N1 consecutive gratings that correspond to the same wavelength, the said series being themselves distributed in identical sets, each of which contains N2 consecutive series that correspond to different wavelengths, and by the fact that, in at least two optical fibres, the numbers N1 of gratings of a series and the numbers N2 of series (4) of a set (5) are determined in such as way that the measurement of differences between the wavelengths of the incident light transmitted in each of the said optical fibres and the wavelengths of the light reflected by the Bragg gratings enable to locate the deformations to which the structure is subjected on the one hand and, on the other, to measure the elongation of the said optical fibres where the deformation occurs.

2. Process according to claim 1, characterised by the fact that in at least two optical fibres, the numbers N1 of gratings of a series (4) are equal, and the numbers N2 of series (4) of a set (5) are prime to each other.

3. Process according to claim 1, characterised by the fact that in at least one optical fibre, the number N1 of gratings in a series is equal to the number of gratings of a set in another optical fibre.

4. Geosynthetic fabric for the application of the process according to any one of the claims 1 to 3, characterised by the fact that it contains a plurality of optical fibres (2a to 2e) in parallel, the said optical fibres containing Bragg gratings (3), evenly spaced in series (4) of Nl consecutive gratings that correspond to the same wavelength, the said series (4) being themselves distributed in identical sets (5) of N2 consecutive series that correspond to different wavelengths.

5. Geosynthetic fabric according to claim 4, characterised by the fact that the optical fibres (2a to 2e) include a sheath to protect them against shear failure, due to aggressive agents in the soil, and against corrosion.

6. Geosynthetic fabric according to one of the claims 4 or 5, characterised by the fact that the optical fibres (2a to 2e) are laid in the direction of the length of the said geosynthetic fabric.

7. Geosynthetic fabric according to any one of the claims 4 to 6, characterised by the fact that the optical fibres are inserted in the said geosynthetic fabric during its manufacture.